

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Michael W. Barry, Jack N. Bartholmae, Francis A. Rowe, E. Neal Tompkins
and Peter A. Zuber

Examiner: Not Yet Assigned

For: METHOD AND APPARATUS FOR DETERMINING TONER LEVEL IN
ELECTROPHOTOGRAPHIC PRINT ENGINES

Assistant Commissioner for
Patents
Washington, D.C. 20231

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DC 20231 on

Dear Sir:

(Date of Deposit)
Gregory M. Howison Reg. No. 30,646
(Name of Person Mailing Document)

(Signature)

(Date of Signature)

PRELIMINARY AMENDMENT

Prior to the initial review, please amend the application as follows.

IN THE TECHNICAL FIELD OF THE INVENTION

Please delete the present paragraph in its entirety and insert therefor:

--The present invention pertains in general to electrophotographic print engine systems
and, more particularly, to determining the toner level prior to printing.--

IN THE CROSS REFERENCE TO RELATED APPLICATIONS

Please delete the current statement in its entirety and insert therefore:

--This Application is a Continuation of Serial No. 09/044,539, filed March 19, 1998, titled "METHOD AND APPARATUS FOR DETERMINING TONER LEVEL IN ELECTROPHOTOGRAPHIC PRINT ENGINES" (Atty. Dkt. No. TRSY-23,859), which is a Continuation-In-Part of U.S. Patent No. 5,859,711 issued January 12, 1999, titled "MULTIPLE PRINT ENGINE WITH VIRTUAL JOB ROUTING" (Atty. Dkt. No. TRSY-23,684), which is a Continuation-in-Part of Serial No. 08/511,641, filed August 7, 1995, titled "VIRTUAL SINGLE PRINTER ENGINE WITH SOFTWARE RIP" (Atty. Dkt. No. TRSY-23,617), which is related to U.S. Patent No. 5,596,416 issued January 21, 1997, titled "MULTIPLE PRINTER MODULE ELECTROPHOTOGRAPHIC PRINTING DEVICE" (Atty. Dkt. No. TRSY-22,391).--

IN THE SUMMARY OF THE INVENTION

Please delete the entire Summary of the Invention in the present application, and insert therefor:

--A method is disclosed for determining the amount of toner required to render a print job using a print engine at a printing location without prior information about the toner level thereof, comprising the steps of accumulating in a first register the toner values of all the pixels in a rasterized image prior to sending the print job to the printing location; decrementing the toner level register for the print engine at the printing location if the accumulated value is less than or equal to the toner level of the print engine; and sending the print job to the print engine at the printing location for rendering.--

IN THE CLAIMS

Please delete Claims 1-38 in the present application and insert the following claims:

39. (New) A method for determining the amount of toner required to render a print job using a print engine at a printing location without prior information about the toner level thereof, comprising the steps of:

5 accumulating in a first register the toner values of all the pixels in a rasterized image prior to sending the print job to the printing location;

decrementing the toner level register for the print engine at the printing location if the accumulated value is less than or equal to the toner level of the print engine; and

10 sending the print job to the print engine at the printing location for rendering.

40. (New) The method of Claim 39, further comprising the step of:

sending the print job to an alternative print engine for rendering if the accumulated value is greater than the toner level of the print engine at the printing location.

41. (New) The method of Claim 39, wherein the step of accumulating comprises the steps of:

expressing the toner value of each pixel in the rasterized image as one of a plurality of incremental units between zero and maximum black; and

5 accumulating the toner values for all of the non-zero-valued pixels in the rasterized image in the first register.

42. (New) The method of Claim 41, wherein the step of decrementing comprises the steps of:

comparing the value in the first register with the toner level register for the print engine at the printing location; and

5 subtracting the value in the first register if it is less than or equal to the value in the toner level register for the print engine at the printing location.

43. (New) The method of Claim 39, wherein the step of accumulating comprises the steps of:

determining an average toner value for the pixels of the rasterized image;

5 defining the toner required for rendering the rasterized image as a percentage of a maximum black page; and

entering the defined toner required into a second register.

44. (New) The method of Claim 43, wherein the step of decrementing comprises the steps of:

comparing the value in the second register with the toner level register for the print engine at the printing location; and

5 subtracting the value in the second register if it is less than or equal to the value in the toner level register for the print engine at the printing location.

IN THE ABSTRACT OF THE DISCLOSURE

Please delete the entire Abstract of the Disclosure in the present application, and insert therefor:

--A method for determining the amount of toner required to render a print job using a print engine at a printing location without prior information about the toner level thereof, comprising the steps of accumulating in a first register the toner values of all the pixels in a rasterized image prior to sending the print job to the printing

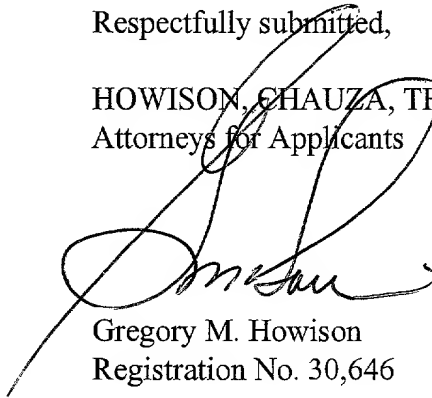
location; decrementing the toner level register for the print engine at the printing location if the accumulated value is less than or equal to the toner level of the print engine; and sending the print job to the print engine at the printing location for rendering.--

REMARKS

Please charge any additional fees or deficiencies in fees or credit any overpayment to Deposit Account No. 20-0780/TRSY-25,474 of HOWISON, CHAUZA, THOMA, HANDLEY & ARNOTT, L.L.P.

Respectfully submitted,

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